

matemáticas y ciencias
MATHAND
Northern New Mexico
Math and Science Academy

Program Description

The Northern New Mexico Council on Excellence in Education (NNMCEE) developed the Math and Science Academy (MSA) with support from local school districts (Chama, Española, and Mora), the Northern Network for Rural Education, the University of California and the Department of Energy's Los Alamos National Laboratory. In the initial year of implementation, MSA's goal was to significantly improve math and science education, as part of a larger systematic change initiative to improve education for the students of Northern New Mexico. The project aimed to provide middle school teachers and their students the opportunity to work with exemplary science and math mentors and gain content knowledge, experience, and expertise by working collaboratively with a cadre of other committed schools and teachers.

The MSA project addressed multiple purposes, including providing teachers with access to rich professional development sessions to increase content and pedagogical knowledge; stimulating teachers to consider how well their instruction is preparing students for high school academics and how it can better do so; providing tools and conceptual structures for content area instruction that can be integrated directly into classroom teaching and learning practices; and providing students with opportunities to engage in higher quality science, math, social studies and language arts learning experiences. Initially, MSA targeted middle school students, in an effort to stem the high drop-out rate in 9th grade (8.1% in 1997, higher for Latino males), and to allow teachers adequate time to help their students develop the knowledge, interest, and enthusiasm to enroll in challenging high school classes. Finally, the first year of the project aimed to improve the overall quality of education in middle schools in Northern New Mexico, by providing opportunities for all students to engage in high-quality learning experiences taught by qualified, knowledgeable instructors.

Student test scores and teacher competency surveys reveal a tremendous need for improving student achievement and teacher preparation in northern New Mexico. MSA is, therefore, designed to (1) utilize master teachers and research-based best practices to significantly improve math, science, and technology education; (2) initiate systemic reform in northern New Mexico schools and colleges; (3) increase the pool of qualified teachers (Table 17); and (4) serve as a national model for improving mathematics, science, and technology education in rural communities. Development of the academy is viewed by northern New Mexicans as a very positive and necessary "good neighbor" initiative with the Laboratory. School districts were invited to apply for participation in the Math and Science Academy in late spring of 2000, and three schools (Figs. 25–27) were selected according to criteria developed by NNMCEE. The selected schools—Chama Middle School, Mora Middle School, and Española Middle School East—participated in the program during school year 2000–2001. The four core area (language arts, math, science, and social studies) teachers from each site—twelve teachers in all—took part in

Table 17. 2000–2001 MSA Teacher Demographic Information

<i>Variable</i>	<i>Descriptor</i>	<i>n=12</i>
Sex	Male	3
	Female	9
Ethnicity	White	2
	Hispanic/Latino	10
	Native American	0
Highest Degree Received	Bachelor's + Credential + units	5
	Master's	2
	Master's + Units Beyond	5
Teaching Credential*	General Elementary	6
	General Secondary	4
	Special Emergency	0
	Multiple Subject	5
	Single Subject	3
	Bilingual	3
	Other: (K12, Spanish, Early Childhood)	3
Years of Experience	Average Number:	13 years
	Range	3–28 years
Previous participation in projects like MSA	Yes	5

*Figure 25. Students from Chama Middle School.*

training during the summer of 2000 and at the follow-up sessions during the year.

During the 2001–2002 school year the program expanded to include all the 7th grade teams at the Española Middle School East and one 8th grade team at Española Middle School West, who are teaching the students taught last school year by MSA teachers. Twenty-two teachers are

participating in the program this year, an increase of ten over the previous year. New components to the program this school year include three student teachers and a summer leadership institute for principals and district administrators of the participating schools. The bulk of the professional development occurs during an intensive summer institute focused on standards-based learning; assessments, including rubrics and portfolios; instructional strategies, including cooperative learning and integrating technology into the curriculum; and curriculum alignment. This school year there was an additional leadership institute for the principals and administrators from the three

*Fig. 26. Students from Mora Middle School.*



Figure 27. Students from Española Middle School, East.

participating districts to initiate the systemic change necessary for the success of the program. Another new aspect of the program this year is the student teacher component. Each site will have a student teacher for the spring semester to begin work towards one of the goals of MSA—to increase the pool of qualified teachers. The three selected student teachers participated in the summer training institute along with other new and returning teachers.

Many studies including the Glenn Commission Report, “Before It’s Too Late,” emphasize the importance of teacher quality on student achievement. The focus of the MSA program is to improve teacher quality by delivering professional development based on the latest research and by providing follow-up support in the classroom. Two master teachers form one of the core components of the MSA. One master teacher, Carol Brown, has been with MSA since its inception. The other, Catherine Berryhill, joined MSA in June 2001, filling the position vacated by Patricia Alvarado, who left the program in March of 2001. These master teachers are using their expertise in content, pedagogy, and reform initiatives to design and deliver most of the professional development and to follow up on site. During the 2000–2001 school year, master teachers visited sites once a week. The design has been modified based on input from participating teachers, and this school year, master teachers make extended visits to the outlying sites: Chama and Mora. There is a three-day visit and a one-day visit to each site each month.

The initial grade levels targeted are those in the middle schools of the respective schools: grades 6–8 in Chama and Mora, and grades 7–8 in Española. Last school year teachers worked with 7th grade students. This year the teachers in Chama Middle School and Mora Middle School are using MSA strategies with all the grade levels that they teach (6th–8th), and the program has expanded in Española to include all the 7th grade teams and one 8th grade team (following last year’s 7th graders.)

The National Staff Development Council states in their standards that staff development that improves the learning of all students

- Organizes adults into learning communities whose goals are aligned with those of the school/district,
- Requires skillful school/district leaders to guide continuous instructional improvement, and
- Requires resources to support adult learning and collaboration.

It also says that staff development should deepen educators’ content knowledge, provide them with research-based instructional strategies to assist students in meeting rigorous academic standards, and prepare them to use various types of classroom assessments appropriately. Staff development should provide educators the knowledge and skills to involve families and other stakeholders appropriately. It should also be data-driven, research-based, and have multiple sources of information for evaluating the program. (Full text at <http://www.nsdc.org/educatorindex.htm>) MSA is designed to provide training for teachers that is aligned to these standards.

The summer institutes (Fig. 28) are followed by classroom observations using the cognitive coaching protocol. This protocol involves a pre- and post-conference around a formal observation session. The questioning technique employed in the conferences promotes teacher self-reflection

and focuses on student learning. The nonevaluative nature of the protocol encourages teacher self-evaluation and thus accomplishes change from the bottom up. (The protocol is included at the end of this report.) Studies by Joyce and Showers show that even when teachers receive high-quality training, classroom implementation remains at about 5%. When professional development includes time for practice and feedback and the curriculum is adapted for the innovation, the percentage increases. However, implementation increases to 90% when professional development includes coaching in the design.



Figure 28. New teachers work diligently during the 2001 summer.

Teacher progress portfolios are a new dimension to MSA this year. Studies have shown that creating a portfolio will help teachers to focus on how they are incorporating what they learned during the summer institute into their practice. Teachers meet after school on a weekly basis to continue discussing standards, curriculum, assessments, and instruction. At Mora (Fig. 29) and Chama these weekly meetings are the only common planning time they have, while in Española each team has a daily common prep. Thus, in Española the after-school meetings are being held by content area, and a school-wide



Figure 29. Teachers meet after school in Mora.

meeting is held once a month. Teachers use their common prep time once a week to discuss team issues. This time for dialogue between teachers is a critical part of the design of the program. The intent is to develop a culture at the schools where discussion and sharing about best practices, sound pedagogy, and student welfare is the norm and is built into the instructional day.

Performance Objective and Milestones

The initial performance objective for MSA is sustained change in teacher practice that supports standards-based education. The ultimate objective is documented increase in student achievement in math, science, and technology application.

Standards-based education is a national movement that was initiated by the report "A Nation at Risk," by the National Commission on Excellence in Education in 1983. Today, all but one state has some form of standards in place. In New Mexico the State Department of Education has put into regulation content standards and benchmarks in nine content areas. Standards-based education, however, is more than content standards; defining content standards (what all students should know and be able to do) is only the first step. Standards-based education sets the goal for all educators to ensure that all students meet standards. No longer can teachers teach the subject, assess the learning, assign grades, and then move on. Teachers are given the mandate to ensure students have certain knowledge and skills in the content areas. Now it is imperative for teachers first to know and be able to define what it is they want students to learn (what students must know and be able to do.) Then they must design assessments that will inform them whether students have indeed met these standards. Finally, they must design the activities that will allow students to create the learning so that students are able to perform successfully on those assessments.

Assessment that is meaningful to the students as well as the teachers becomes a very important part of the teachers' practice. Once teachers develop the assessments that will let them know if students are meeting standards, they then must plan the instruction—all the teaching and learning activities—that will help the students perform competently on the assessments. Students must not only have a clear idea of the learning goals, they must also have a clear idea of what exemplary work/performance looks like. The target should not be a mystery. Well-designed rubrics and samples of exemplary work help everyone know what the target is. Everyone: teachers, students, parents, administration should know when a student has met a standard.

What happens when a student does not meet a standard? After a teacher has planned for the unit and a student has participated in the instruction and assessments, what does a teacher do if a student just cannot meet the standard? Standards-based education helps the teacher to reflect on his/her practice. Where can the remediation take place? Is it in the design of the assignments/activities? Is the stumbling block in the design of the assessment? Does the student just need more time and more ways to meet the standard? Who will work with these students, and when will extended remediation take place? These are questions that need to be addressed by teachers and administrators who are committed to standards-based education.

The types of changes in teacher practices being targeted in MSA include how assessments are changing to reflect standards, how instruction is changing to become more student-centered, and how curriculum is being refined to align to standards. For these changes to occur, professional development must include introduction to best practices, time for teacher collaboration, and time for teacher reflection.

Teachers currently in the program have classroom experience ranging from zero to 28 years. Teachers are at different points in their journeys

as educators, and they are traveling at different speeds. It is difficult to apply a standard instrument to measure their progress towards standards-based education, especially since it is so multifaceted. Teachers have been asked to focus on one or two parts to study in-depth this school year. They are addressing these areas in their progress portfolios. They are collecting their work related to the areas as well as samples of the student work that is produced, and they will be reflecting on what they discover. Master teachers are using the cognitive coaching protocol to help teachers reflect on their practices, focus on student learning, and thus chart the progress of the teachers throughout the year.

The goals of the Math and Science Academy align with the institutional goal to refocus the Laboratory hiring on entry-level and strategic hires, with a simultaneous emphasis on diversity in all forms (diversity of people, fields, and technical ideas.) In order to increase the size of an educated and trainable work force, the schools in northern New Mexico need to provide focused and effective education to the students. Skilled and dedicated teachers are the key to increasing not only math and science achievement, but to increasing the number of students who are proficient in communication, problem solving, and learning what it takes to succeed in the future. Students who are thus prepared will be more likely to go to college and be successful. In areas like northern New Mexico, these successful students are more likely to return to their communities and look for work in the local area. One of the goals of the MSA is to ultimately increase this pool of qualified applicants for positions at the Laboratory. There have been some positive changes in teacher practice since the 2000 MSA summer institute. According to external evaluators from the National Center for Research on Evaluation, Standards, and Student Testing (CRESST) at the University of California, Los Angeles,

“Survey results, observations and interviews of the twelve MSA teachers

indicate that the project influenced teachers in a number of ways. Specifically, MSA had an impact on teachers' (1) collaboration, planning and articulation (Table 18); (2) knowledge and familiarity of current research on teaching and learning, including grouping practices; (3) types of assignments, activities and assessments used; and (4) understanding of content area standards and standards-based instruction. These areas of impact were observed and reported to varying degrees at individual sites and for individual teachers in the project. Teachers reported the greatest amount of MSA impact on their willingness and interest in collaborating and planning with their colleagues. This finding was substantiated in our observations of teachers at their sites. As the school year progressed, we heard teachers more frequently engaged in formal and informal conversations about teaching, learning and MSA."

The evaluators added that

"Collaborating with colleagues in meaningful ways meant that teachers discussed student work and instructional needs rather than focusing on the more negative aspects of school life, such as student behavior, administrative issues and the

like. Further, teachers reported a higher degree of articulation and alignment of performance and behavior standards for students at their school sites as a result of these ongoing conversations."

The report also notes that on survey results teachers report only a moderate change in their approaches to guiding and facilitating student learning based on MSA work. The evaluators note,

"... this was an experienced group of teachers, with well-established teaching preferences and patterns. As such, there was some reluctance initially to try different instructional approaches, including cooperative learning groups, group projects and more student-centered assignments. As the school year progressed, a willingness to try new approaches and ideas was endorsed quickly by some MSA teachers and more slowly by others."

As a response to another survey question, many teachers reported that MSA had an impact on the types of assignments and activities they utilized in their classrooms. The evaluators noted,

"Work during the summer institute and follow-up sessions with project mentors

Table 18. MSA Teacher Collaboration, Planning, and Articulation

<i>To what extent do you agree with the following statements:</i>	Mean (SD)
I develop yearlong and short-term goals for my students.	4.2 (0.3)
I select content and adapt and design curricula to meet the particular interests, knowledge, skills and experiences of my students.	4.3 (0.2)
I use strategies that develop student understanding and nurture a community of learners.	4.1 (0.2)
I work with my colleagues within and across disciplines.	4.4 (0.2)

highlighted the importance of providing a wide variety of learning settings and opportunities for students, in particular to provide learning settings in which students were involved with generative learning experiences. Teachers also were encouraged to experiment with project-based approaches to teaching and learning.”

The teachers’ assessment practices also began to focus more on student learning. Teachers reported (Tables 19 and 20) that they

“began to understand that their “old” or traditional methods of assessing student learning were limited in the kinds of information about student learning that could be gleaned from these tasks.”

One teacher commented,

“I have learned to ask myself why I’m teaching what I’m teaching and get more relevant information out of the assessments I use with/for my students.”

In the area of standards-based instruction, teachers are developing fluency with the terminology and the instructional sequence outlined in the content standards. They are also making the connection between what they teach and assess

with the standards. On the survey teachers said that MSA was moderately effective in familiarizing them with standards-based instruction and content standards and benchmarks, in helping to develop interdisciplinary units, and in sharing assessment strategies.

The evaluators studied the results from the Comprehensive Test of Basic Skills (CTBS) Terra Nova Plus norm-referenced standardized tests that were administered to students at all three sites. They found no significant increase in scores or only a minimal increase of student test scores in all subject areas. They did add,

“A number of caveats about the validity of using standardized tests as a measure of program impact should be mentioned. First, MSA is a new project and as such, it will take time to see the results in test scores. Second, standardized tests have come under criticism for not being generally sensitive to instructional changes nor are they well aligned with what teachers are teaching and the standards to which teachers and schools are being held accountable. Finally, quality implementation of project goals requires complete teacher buy-in and time to learn new techniques and incorporate them effectively into the teaching and learning process. High-quality implementation of

Table 19. Guiding and Facilitating Learning

<i>Please answer the following statements based on your participation in MSA:</i>	Mean (SD)
I focus and support inquiry as I interact with my students.	4.1 (0.2)
I orchestrate discourse among students about ideas.	3.7 (0.2)
I challenge students to take responsibility for their learning and to work collaboratively.	4.4 (0.1)
I recognize and respond to student diversity and encourage all students to participate fully in learning.	4.8 (0.1)
I encourage and model the skills of inquiry as well as curiosity, openness to new ideas, and skepticism that characterize continuous learning.	4.5 (0.1)

Table 20. MSA Effectiveness

<i>How effective was MSA in the following areas</i>	Mean (SD)
Familiarizing you with standards-based instruction	3.9 (0.3)
Developing your knowledge of state frameworks for content areas	3.9 (0.3)
Helping you develop interdisciplinary curriculum units	3.9 (0.3)
Providing demonstration lessons that were meaningful and relevant to you and your students	3.7 (0.3)
Sharing assessment strategies	3.8 (0.3)
Informing/involving the community about MSA goals and objectives	3.5 (0.9)

Note: Scale-1=Not effective; 3=Somewhat Effective; 5=Highly Effective

new strategies is required before significant changes in student learning can be expected, in particular on a general measure of student achievement, such as a standardized test.

Highlights of This Year's Accomplishments

During October 2000–May 2001, master teachers visited school sites approximately once a week. While in the classrooms, they interacted with the students, team taught with the classroom teachers, and occasionally demonstrated lessons. They also substituted in classrooms to allow a teacher to observe other MSA teachers. Master teachers met with the participating teachers at each site after school for two hours. During those sessions, teachers discussed issues surrounding students, the implementation of the integrated unit that was designed during the 2000 summer institute, lesson plans, and during the spring, some professional development on cooperative learning was accomplished. Master teachers also gave presentations to school boards and to personnel at district offices to familiarize them with MSA and its objectives. Additionally, teachers from all sites met four times during the school year for Saturday sessions to further

extend their understandings of new ideas presented in the project and to collaborate with teachers at the other MSA sites. Master teachers, teachers, and students also gave MSA evening presentations for parents and community members.

One of the highlights was the field trip to Santa Barbara Canyon that students from Mora and Española enjoyed. Students traveled in small groups with a parent volunteer to five different stations where they had experiences in bird watching, a soil investigation, a nature walk, a written reflection, and a macroinvertebrate study. It was an example of collaboration between several entities to bring a rewarding experience to the students. La Jicarita Enterprises provided funding for the buses for this trip. Jaime Brytowski from the NM Department of Game and Fish designed one of the stations where students collected and observed macro-invertebrates. Donna House, a naturalist, volunteered her time to lead a nature walk. Judy Chaddick, the science specialist from the Española district, led the bird watching for the Española students and allowed us to borrow all her equipment for the Mora students. Linda Alane, the language arts teacher from Española, designed the reflection activity. Paige Prescott designed the soil

investigation. Parent volunteers acted as group leaders. Everyone involved with the event learned something new and had a very wonderful time.

Another highlight, especially for the students in Mora, was the dissection. Frog dissections in 7th grade had not taken place for many years, so the 7th graders were the envy of the school, and even the talk of the town. Collaboration among the teachers in Mora allowed each of the two 7th grade classes to spend three consecutive class periods dissecting their frogs. Science master teacher Carol Brown facilitated the experience for the students and also for the teacher, who had never dissected a frog before. This was the culminating activity at all three sites for the integrated unit titled "Who Am I?" during which the students had studied body systems in science. The learning goal was to understand the relationships between and the interrelatedness of the systems and to see the spatial arrangements of the different organs. The following are content standard targets for the unit.

Content Standard 3

Students will use form and function to organize and understand the physical world.

Benchmark A

Explain function by referring to form and explain form by referring to function.

Content Standard 10

Students will know and understand characteristics that are the basis for classifying organisms.

Benchmark A

Use information about living things including the roles of structure and function as complementary in the organization of living systems.

One of the most rewarding experiences in Española occurred during an MSA awards night (Fig. 30). Students and parents assembled bringing desserts and applauded the students who were chosen. Teachers picked their own categories such as best attendance, most improved, highest achievement, etc. Parents, teachers,

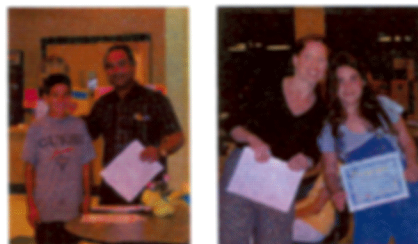


Figure 30. Española MSA Awards Night.

students, and administrators conversed over dessert, and cheered the achievement of the students. Some students shared the poetry they had written in Language Arts, and parents were able to see other poetry that was displayed on the walls (Fig. 31). Again, La Jicarita Enterprises showed their support of the program and helped fund the event by providing part of the refreshments.



Figure 31. Poetry on character counts.

Students in Española participated in an MSA T-shirt design contest. Some of the LANL Foundation grant was used to underwrite the cost of producing the T-shirt. The winning design has a low-rider truck carrying a mountain. The caption under the picture reads, "We Move Mountains." Many students paid a nominal fee to purchase a T-shirt to commemorate their first year in the Math and Science Academy (Fig. 32).



Figure 32. Student-designed T-shirt.

Teachers reconvened after the end of school to evaluate their experiences in MSA (Fig. 33). They discussed various aspects of success, difficulties, promising strategies, what to keep, what to change, and what they wanted to include the next year. They also spent time with Ellen Osmundson from CRESST filling out surveys and being interviewed.



Figure 33. End-of-year evaluation session.

In July, principals and administrators from the three districts were invited to a leadership institute to find out what the teachers had learned during the year and to participate in some of the same activities (Fig. 34). The conversation about a model that could transfer to the district was initiated so that district people could anticipate the impact on their budgets in subsequent years.



Figure 34. Administrators' meeting.

July 23, 2001, was the start of the summer institute for teachers new to the program. There were two teachers replacing two participants from 2000–2001, and ten other teachers were joining the program along with three student teachers. An intensive week was spent trying to give them an experience similar to the 2000 summer institute. The returning teachers joined them for six more days of training. Then all school teams were given four days to work on curriculum design and integration at their school

sites. Included in the training was more in-depth work on assessments: rubrics and portfolios, cooperative learning, use of technology in the classroom, and standards-based learning. The whole group worked with Ellen Osmundson on developing an observation instrument. There was also a lot of time spent on team building and community building.

This summer there was a concentrated focus on the use of technology in the classroom. Northern New Mexico Community College opened their doors to MSA and gave teachers access to the outstanding facilities in the Student Success Center. Cathy Berryhill shared her expertise in this area and worked with the teachers to show them how to use the Marco Polo website, as well as the Teacher Tools, Inspiration, Timeliner, and Microsoft Office software programs (Fig. 35). Through the generous contributions of the Regional Educational Technology Assistance (RETA), teachers received free copies of all the software. Teachers this year are required to spend 30 minutes per week, online, responding to posts on the MSA e-group community, checking their e-mails and surfing the Internet for appropriate materials they might use in their lesson planning.



Figure 35. Teacher technology training.

All original teachers have computers in their rooms, and work is in progress to provide the same access for all new teachers this year. In addition, there are three laptop computers with external CD burners, zip-drives, and In-Focus projectors, for teachers to check out and use with their classes. The project is anticipating a shift in responsibilities this year from the master teachers to the classroom teachers. MSA teachers are taking on more of the responsibility for

collecting and developing evidence of change in practice. The teachers are asked to present their work to each other, including student products, in preparation for their future work as leaders and mentors in their schools. They will become district mentors helping to lead schools into reform that makes teaching and learning meaningful and efficient for students and teachers. The master teachers' roles are evolving into that of professional developers. In order for systemic reform to take place, everyone, from students, communities, teachers and district administrators, must understand the vision of standards-based education and how to implement it. MSA teachers must mentor other teachers and master teachers/professional developers who will spread the reform throughout the districts.

The following pages are taken from *Cognitive Coaching: a foundation for Renaissance Schools* by Arthur L. Costa and Robert J. Garmston,

Christopher-Gordon Publishers, 1994. They illustrate the cognitive coaching protocol that is used with the teachers (Fig. 36).

Teacher Coaching Sessions, Planning Conference

Describe

State the purpose of the lesson. What is your lesson going to be about today? What do you want your students to learn? What standard and benchmark are you working towards?

Translate

Translate the purposes of the lesson into descriptions of desirable and observable student behaviors. As you see the lesson unfolding, what will your students be doing?

Predict

Envision teaching strategies and behaviors to facilitate students' performance of desired behaviors. As you envision this lesson, what do

MSA OBSERVATION FORM 2001-2002

Date:	Teacher:	Observer:	
Time:	# students:	Demographics:	

Work setting: Diagram			
Student	Teacher	Lesson	Assessment
Other observations/comments:			

Figure 36. MSA observation form layout.

you see yourself doing to produce those student outcomes?

Sequence

Describe the sequence in which the lesson will occur. What will you be doing first? Next? Last? How will you close the lesson?

Estimate

Anticipate the duration of activities. As you envision the opening of the lesson, how long do you anticipate that it will take?

Operationalize criteria

Formulate procedures for assessing outcomes (envision, operationally define, and set criteria). What will you see/hear students doing that will indicate to you that your lesson is successful?

Metacogitate

Monitor your own behavior during the lesson. What will you look for in students' reactions to know if your directions are understood?

Describe

Describe the role of the observer. What will you want me to look for and give you feedback on while I am in your classroom?

Reflecting Conference**Math and Science Academy 2001–02****Teacher-Assess**

Express feelings about the lesson. As you reflect back, how do you feel it went?

Recall and Relate

Recall student behaviors observed during the lesson to support those feelings. What did you see students doing (or hear them saying that made you feel that way?

Recall

Recall their behavior during the lesson. What do you recall about your behavior?

Compare student behavior performed with student behavior desired. How did what you observe compare with what you planned?

Compare

Compare teacher behavior performed with teacher behavior planned. How did what you planned compare with what you did?

Infer

Make inferences about the achievement of the purposes of the lesson. As you reflect on the goals for this lesson, what can you say about your students' achievement of them?

Metacogitate

Become aware and monitor one's own thinking during the lesson. What were you thinking when you decided to change the design of the lesson? Or what were you aware of that students were doing that signaled you to change the format of the lesson?

Analyze

Analyze why the student behaviors were or were not achieved. What hunches do you have to explain why some students performed as you had hoped while others did not?

Cause and Effect

Draw causal relationships. What did you do (or not do) to produce the results you wanted?

Synthesize

Synthesize meaning from analysis of this lesson. As you reflect on this discussion, what big ideas or insights are you discovering?

Self-prescription

Prescribe alternative teaching strategies, behaviors or conditions. As you plan future lessons, what ideas have you developed that might be carried forth to the next lesson or other lessons?

Evaluate

Give feedback about the effects of this coaching session and the coach's conferencing skills. As you think back over our conversation, what has this coaching session done for you? What did I do, or not do, for you? What assisted you? What can I do differently in the future?